

REMARKS

Reconsideration and further examination of this application is hereby requested. Claims 1-32 are currently pending in the application.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached pages are captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

A. Allowable Subject Matter

Applicant appreciates the Examiner's indication that claims 30-32 recite allowable subject matter. Claim 30 has been amended to be in independent form. Accordingly, Applicant respectfully submits that now independent claim 30, as well as claims 31 and 32 which depend from 30, are in condition for immediate allowance.

B. Drawing Objections

Applicant notes the official draftsman's objection to the drawings. Applicant respectfully seeks to defer submission of formal drawings.

C. Obviousness Rejections

Claims 1, 4, and 12-29 have been rejected under 35 U.S.C. § 103(a) as being obvious over Suzuki (U.S.P. 6,307,210) in view of Nayar (U.S.P. 4,893,183). Claims 2, 3, and 5-11 have been rejected under 35 U.S.C. § 103(a) as being obvious over Suzuki in

view of Nayar, and further in view of King (U.S.P. 6,236,747). These rejections are respectfully traversed based on the following arguments.

The Suzuki disclosure utilizes optical elements to help produce an image at a single camera. Likewise, the Nayar disclosure utilizes optical elements to help produce an image at a single camera. However, any similarities beyond that are rather attenuated. The Examiner reasons that it would have been obvious for the location determination teachings of Nayar to be used by a person having ordinary skill in the art to augment the image capture structure of Suzuki. That reasoning does not take into account some very important distinctions between what Suzuki and Nayar disclose.

In particular, the location determination algorithm developed by Nayar is based on mathematics that relies on the fact that it utilizes reflective spheres as its optical elements.

As Nayar points out (col. 3, lines 62-64), it is a physical fact that no two points on the surface of a sphere have the same surface normal vector. Importantly, Suzuki does not use spherical reflectors -- all reflectors used by Suzuki are planar.

In stark contrast to a sphere, every point on the surface of a planar reflector has the same surface normal vector. Thus, in terms of specular reflection the reflector used by Nayar is the

exact opposite of the reflector used by Suzuki.

In order to use the location determination teachings of Nayar in the system Suzuki, it would be necessary to entirely throw out the basic operating principle of the Suzuki reflector system and start fresh. Such fundamental and sweeping changes would simply have been too much modification and experimentation to fall within what would have been merely obvious. It has been adjudicated that obviousness does not lie when the proposed modification of the prior art would involve changing the principle of operation of a reference. See M.P.E.P. § 2143.01 (8th ed. 2001).

The further consideration of King together with Nayar and Suzuki does nothing to rectify the flawed combination reasoning.

Accordingly, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness with respect to claims 1-29.

D. Closing

For the above reasons, Applicant respectfully submits that the application is in condition for allowance with claims 1-32. If there remain any issues that may be disposed of via a telephonic interview, the Examiner is kindly invited to contact the undersigned at the local exchange given below.

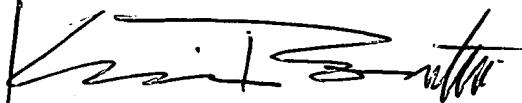
The Director of the Patent and Trademark Office is

AMENDMENT UNDER 37 C.F.R. § 1.111
Appln. No. 09/351,892

PATENT APPLICATION

authorized to charge any necessary fees, and conversely, deposit any credit balance, to Deposit Account No. 18-1579.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Amend claim 30 as follows:

30. (Once Amended) [The] A method [of claim 29 further comprising the step of] for three dimensional inspection of a lead on a part, the method comprising the steps of:

using a camera to receive an image of the lead;
transmitting the image of the lead to a frame grabber;
providing fixed optical elements to obtain a side perspective view of the lead;
transmitting the side perspective view of the lead to the frame grabber;
operating a processor to send a command to the frame grabber to acquire images of pixel values from the camera;
processing the pixel values with the processor to calculate a three dimensional position of the lead;
determining a lead center location and a lead diameter in pixels and storing the lead center location and lead diameter in memory;
converting the pixel values into world locations by using pixel values and parameters determined during calibration wherein the world locations represent physical locations of the lead with respect to world coordinates defined during calibration, wherein

a Z height of each lead is calculated in world coordinates in pixel values by combining a location of a center of a lead from a bottom view with a reference point of the same lead from a side perspective view;

converting the world coordinates to part values using a rotation, X placement value and Y placement value to define part coordinates for an ideal part where the part values represent physical dimensions of the lead including lead diameter, lead center location in X part and Y part coordinates and lead height in Z world coordinates; and

comparing ideal values defined in a part file to calculate deviation values that represent a deviation of the center of the lead from its ideal location.